

REMARKS

I. Examiner's Response to Arguments

In the Examiner's Response to Arguments, the Examiner expressed confusion over the phrases "writing to" and "field programming" and asked that this issue be clarified. To address this issue, Applicants have amended independent Claims 1, 18, and 36 to remove the "writing to" language and replace it with "field programming" language. With these amendments, the independent claims now use the phrase "field programming" instead of "writing to." Applicants submit that this fully addresses the Examiner's concerns.

II. 35 U.S.C. § 112, Second Paragraph, Rejections

Independent Claims 1, 18, and 36 were rejected under 35 U.S.C. § 112, second paragraph, for omitting a test step. The Office Action asserted that redundancy acts are typically performed as a result of testing a memory array, and the test step was missing from the claims. Applicants respectfully traverse these rejections. As explained in more detail below, the claims are directed to operations that occur when field programming a memory array with data — not when testing a memory array during the manufacturing process. Accordingly, the step of testing a memory array is not a required step in the claims.

III. 35 U.S.C. § 103(a) Rejections

Independent Claims 1 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the proposed combination of U.S. Patent No. 5,831,989 to Fujisaki and U.S. Patent No. 6,553,510 to Pekny, and independent Claim 36 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the proposed combination of Fujisaki, Pekny, and U.S. Patent No. 5,278,839 to Matsumoto et al. Applicants respectfully request reconsideration and withdrawal of these rejections in view of the above amendments and the below remarks.

A. No Suggestion to Combine Fujisaki and Pekny

As a first matter, Applicants note that one skilled in the art would not have been motivated to combine Pekny with Fujisaki because Pekny teaches away from such a combination. In its background section, Pekny describes a Fujisaki-type approach of testing a memory array during the manufacturing process — i.e., before the memory is packaged and shipped to an end user. Pekny points out limitations to this approach at col. 2, lines 12-15:

After the memory device is packaged and in used [sic] by an end user, the memory device can experience random memory cell failures. These memory failures often result in the need to replace the memory device.

Pekny goes on to describe a memory device that avoids this problem.

One skilled in the art would not have been motivated to combine Pekny and Fujisaki because the proposed combination would re-introduce the very problem that Pekny sought to overcome.

B. The Proposed Combination Fails to Teach All of the Claim Elements

Even if there were motivation to combine Pekny and Fujisaki, the proposed combination would fail to teach all of the claim elements.

1. Independent Claim 1

In the Office Action, the Examiner admitted that Fujisaki does not teach “the set of memory cells is in the memory array.” In this Amendment, Applicants have amended independent Claim 1 to recite acts to further distinguish from Fujisaki. First, Applicants have made several amendments to the make clear that the claims are directed to field programming and not testing, as in Fujisaki. For example, to remove any ambiguity, Applicants have used the term “field programming” throughout the claim and have removed the phrase “writing to,” to the extent that the use of that term was inconsistent with the term “field programming.”

The use of the term “field programming” alone is sufficient to distinguish from Fujisaki. Fujisaki is directed to a testing apparatus for a memory array. The testing described in Fujisaki occurs during the manufacturing process — i.e., before the memory is packaged and shipped to an end user. The term “field programming” refers to the programming of a memory array after the manufacturing of the memory array. The term “field” in “field programming” refers to the fact that the memory is programming “in the field” (i.e., wherever the end user is), as compared to “at the factory” (i.e., during the manufacturing process). Because the acts relied upon in Fujisaki occur during testing in the manufacturing process and not during field programming, independent Claim 1 is distinguished from Fujisaki.

Applicants have also amended independent Claim 1 to recite that the flag that is field programmed indicates that the redundant block should be read instead of the primary block to read the data. This is different from the asserted flag in Fujisaki, which is basically used as a counter. During testing (again, not field programming) of the memory array, a logical 1 is written to a failure analysis memory every time an error occurs in the test. At the conclusion of the test, the number of logical 1s written to the failure analysis memory is counted to determine whether or not there is a sufficient number of extra rows and columns in the memory array to handle the failures. Because the asserted flag in Fujisaki is merely used as a counter, it does not indicate whether a redundant block should be read instead of the primary block, as recited in independent Claim 1. This provides an additional distinction over Fujisaki.

Pekny was relied upon in an attempt to cure the deficiencies in Fujisaki. However, the proposed combination of Fujisaki and Pekny fails to teach all of the claim elements. For example, independent Claim 1 recites that a flag is field programmed in the set of memory cells allocated to the primary block to indicate that the redundant block should be read instead of the

primary block. As discussed above, Fujisaki does not teach this element because the asserted flag in Fujisaki is merely a counter user to determine whether or not there is a sufficient number of extra rows and columns in the memory array to handle the failures. There is also no teaching in Pekny of this feature. In Pekny, the decision as to whether to read to the primary array or the redundant array is based on an externally-provided address signal — not on a flag that is stored in response to a detected error in field programming, as recited in independent Claim 1.

2. Independent Claim 18

Like independent Claim 1, independent Claim 18 has been amended to make clear that the claim is directed to field programming and not testing. Accordingly, independent Claim 18 is distinguished from Fujisaki for the reasons discussed above in conjunction with independent Claim 1. Further, independent Claim 18 recites, *while attempting to write to the primary block*, determining that an error occurred in writing to the primary block. In contrast, both Fujisaki and Pekny teach a write-read-compare approach (see, for example, col. 1, lines 54-55 of Fujisaki).

3. Independent Claim 36

Independent Claim 36 recites “a three-dimensional memory array of vertically-stacked field-programmable memory cells.” Significantly, there was no assertion in the Office Action that any of the references in the proposed combination teaches this element, which is not surprising since none of them do. For this reason alone, the rejections against independent Claim 36 and its dependent claims should be removed.

C. Summary

In summary, because there is no motivation to combine Pekny and Fujisaki and because the proposed combination does not teach each of the elements recited in the independent claims,

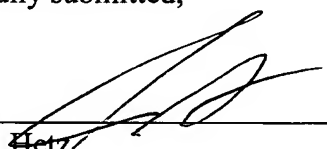
Applicants respectfully request reconsideration and withdrawal of the rejections of independent Claims 1, 18, and 36 and their dependent claims.

IV. Conclusion

In view of the above amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Reconsideration is respectfully requested. If there are any questions concerning this Amendment, the Examiner is invited to contact the undersigned attorney at (312) 321-4719.

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Respectfully submitted,



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